

Appn. Number 10/727,484

Rock Mongrain

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Support for the New Claim in the Specification

Claim 19 (New). An improved apparatus for ground support rotatable by rotation means, said improved apparatus adapted for insertion into a drilled hole penetrating a rock face, the improved apparatus comprising:

- a. a tensionable reinforcing member comprising:
 - i. a longitudinal axis;
 - ii. a diameter;
 - iii. a first end threaded portion having a free end and a first length, wherein said first end threaded portion extends out of said drilled hole;
 - iv. a second end ribbed portion having a second length, wherein said second length of said second end ribbed portion is adapted for total placement within the drilled hole; and,
 - v. at least one first bore, wherein said at least one first bore has a diameter and an inside surface, and wherein the at least one first bore is positionable intermediate of said first length of the first end threaded portion, and wherein the at least one first bore transverses the diameter of the first end threaded portion, and further wherein the at least one first bore is perpendicular to said longitudinal axis;

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b. at least one molded flange nut threadably receivable by the tensionable reinforcing member first end threaded portion, said at least one molded flange nut comprising:

- i. a squared portion adapted to engage said rotation means;
- ii. a beveled flanged portion adjacent to said squared portion and adapted to exert pressure against said rock face;
- iii. a circumferential beveled shoulder between said beveled flange portion and the squared portion, wherein said circumferential beveled shoulder is adapted to abut against the rotation means;
- iv. a second bore having a diameter and extending co-axially through the at least one molded flange nut, said second bore adapted for threaded engagement with the first end threaded portion of the tensionable reinforcing member; and,
- v. at least one third bore located in the squared portion of the at least one molded nut intermediate the axial length thereof and transversing the square portion;

Specification P19L19 to P20L17 & Figure 15

c. at least one flat bearing plate used in combination with the at least one molded flange nut, said at least one flat bearing plate having a circular aperture positioned centrally there within, wherein the at least one flat bearing plate is adapted for placement upon the first end threaded portion of the tensionable

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reinforcing member between the rock face and the at least one molded flange nut; and,

Specification P20L19 to L20 & Figures 16-17

d. at least one shearing element comprising a rolled spring member manufactured from carbon steel and having a variable diameter and adapted to shear at a predetermined torque_{shear}, wherein the at least one shearing element is placed within the axially aligned at least one first bore and at least one third bore thereby temporarily fixing the at least one molded flange nut adjacent to said free end of the first end threaded portion of the tensionable reinforcing member, and further wherein the rolled spring member fails consistently at a predetermined torque_{shear}.

Specification P16L16 to P18L2 & P12L5 to L8

Claim 20 (New). In an improved apparatus for ground support rotatable by rotation means, said improved apparatus adapted for insertion into a drilled hole penetrating a rock face, the improved apparatus comprising:

- a. a tensionable reinforcing member comprising:
 - i. a longitudinal axis;
 - ii. a diameter;

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- iii. a first end threaded portion having a free end and a first length, wherein said first end threaded portion extends out of said drilled hole;
- iv. a second end ribbed portion having a second length, wherein said second length of said second end ribbed portion is adapted for total placement within the drilled hole;
- v. at least one first bore, wherein said at least one first bore has a diameter and an inside surface, and wherein the at least one first bore is positionable intermediate of said first length of the first end threaded portion, and wherein the at least one first bore transverses the diameter of the first end threaded portion, and further wherein the at least one first bore is perpendicular to said longitudinal axis;

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- b. at least one nut threadably receivable by the tensionable reinforcing member first end threaded portion, said at least one nut having a body, said body comprising:

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- i. a squared portion having an axis, a first axial length, and a first width, wherein said squared portion is adapted to engage said rotation means;
- ii. an convex hemispherical portion, adjacent to, coaxial with and integral to said squared portion wherein the convex hemispherical portion permits installation of the tensionable reinforcing member when said rock face is uneven;
- iii. a second bore having a diameter, wherein said second bore extends co-axially through the squared portion and said hemispherical portion of the at least one nut body, wherein said second bore is adapted for threaded engagement with the first end threaded portion of the tensionable reinforcing member;
- iv. at least one third bore having a diameter equal to the diameter of the at least one first bore and an inside surface, said at least one third bore transversing the squared portion of the at least one nut body, the at least one third bore positioned intermediate of the axial length of the squared portion of the at least one nut body, and further wherein the at least one third bore and the at least one first bore are axially alignable when

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the at least one nut body is engaged with the first end threaded portion of the tensionable reinforcing member;

Specification P19L19 to P20L17 & Figure 15

c. at least one bearing plate used in combination with the at least one nut, said at least one bearing plate having a central domed portion and a circular aperture positioned centrally within said central domed portion, wherein the at least one bearing plate is adapted for placement upon the first end threaded portion of the tensionable reinforcing member, and wherein the at least one bearing plate is positionable between the rock face and the at least one nut convex hemispherical portion so that the central domed portion is adjacent to and in confronting relation to the at least one nut convex hemispherical portion, and further wherein said central domed portion circular aperture is adapted for pivoting engagement with the convex hemispherical portion of the at least one nut thereby permitting use of the improved apparatus on uneven rock faces; and,

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an improved shearing element comprising a rolled spring member manufactured from carbon steel adapted to shear at a predetermined torque_{shear}, said at least one shearing element placed within the axially aligned at least one first bore and at least one third bore thereby temporarily fixing the at least one nut adjacent to said free end of the first end threaded portion of the tensionable reinforcing member, and further wherein the rolled spring member fails consistently at said predetermined torque_{shear}.

Specification P16L16 to P18L2 & P12L5 to L8